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PSYCHOLOGICAL VARIABLES AND ABILITY TO PRONOUNCE A SECOND LANGUAGE[1, 2]

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The present study tested the hypothesis that the ability to speak a second language authentically or like a native speaker was related to an individual's sensitivity to cues in interpersonal situations--his empathic capacity. A test of empathy consisting of silent film clips shown at various speeds was shown to Ss who were asked to indicate each observed change in facial expression. A group of 28 Ss took this and additional control tests. Following these tests the Ss learned basic conversations in Japanese in four one-hour sessions. Their pronunciation was then rated by native Japanese speakers on general authenticity and on specific phonetic details for five spontaneous sentences and five sentences repeated after the instructor. The results indicated differences in speaking skills which were related to two clusters of variables representing independent personality characteristics. An empathy dimension was defined by four variables (tolerance to anxiety, intelligence, involvement in emotional experiences, and perception of emotional expression) and was related to correct pronunciation of specific details in spontaneous sentences ($r = +.72$). An intuition dimension consisting of three variables (tolerance to anxiety, intelligence, and psychological mindedness) was significantly related to general authenticity of pronunciation of repeated sentences ($r = +.72$). Each cluster was shown to be a significant predictor of skill in second language pronunciation.

Psycholinguists have suggested in an impressive number of studies that learning, speaking, or doing well in second language training involves abilities unique in academic performance. Their attempts to explicate and to identify the essential skills have provided few substantial or reliable results. There appears in most research a reluctance to analyze the factors involved into specific, measurable units appropriate to the scrutiny of well controlled laboratory research. Too often the subject population is a heterogeneous group of military men, random groups of school students or other existing, uncontrolled populations. The performance of these groups has clearly substantiated the finding that learning and speaking a second language is neither

AL 001 841

directly related to performance in other academic courses, nor is it purely a function of intellectual capacity. Research to determine what skills or abilities are essential to "success" in second language learning calls for rigorous controls on population and criteria. Commonly used criteria of grades in a high school class or the undefined rating of "success" in a military training course involve so many complex and unspecified factors that relevant relationships that might exist have been obscured.

In exploring the complexities of language learning not only must more reliable and clearly defined criteria be employed, but more specific hypotheses must be formulated and more precise measures of performance must be developed. Furthermore, the skills involved in translating, or the skills used instead or in addition to understanding and responding in the new language are in need of specification. Psycholinguists must also take cognizance of the need for greater control and mastery of the intelligence and personality tests employed in exploring differential language abilities. A barrage of tests with cryptic, ill-defined scores which claim to measure personality attributes often provide the researcher with little about the characteristics of normal Ss. Similarly general tests of personality have provided inconsistent and meager results. The researcher must be familiar enough with these resources to answer the specific questions which gross observations of language behavior have suggested are relevant, and to construct and choose from existing measures those that pertain to the specific issues under investigation. This approach is evidenced in a general way in the research of Carroll (1965) and Pimsleur, Sundland and McIntyre (1963) where language ability was analyzed into measurable units and corresponding tests of ability were used. The post-hoc analysis done by Pimsleur and his associates (1963) which placed some confidence in the differential preference of modality (visual-aural) as a variable in success in language learning was an even more exciting attempt to ferret out of the complex factors testable hypotheses.

The present study finds little in the literature to use for comparison or background. The hypothesis grew out of observations in the fields of psychology and linguistics and was tested through the development of specific, specialized measures, which, while by no means unique, were designed to focus on the specific issue. Common observations of language teachers confirm that those students who get high grades or do well in class work are not those who

speak the second language most authentically. The ability to speak a second language well, that is as a native speaker, seems to be evidenced early in training and appears not dependent on motivation or effort. Though this remains a common observation, little attempt has been made to investigate the finding in a controlled way.

The hypothesis proposed to explain differences in the authentic pronunciation of a second language, which exist among equally trained and intelligent individuals is as follows: the more sensitive an individual is to the feelings and behaviors of another person, the more likely he is to perceive and recognize the subtleties and unique aspects of the second language and incorporate them in speaking. In other words, the more empathic an individual is the more he will authentically pronounce a second language. (Guiora, 1967)

Not only does the theory on which this premise is based pertain to the current level of sensitivity and interpersonal situations common to both factors, it can be extended back to the concurrent development of both empathic capacity and language development. The quality of both of these facilities is found to be dependent on a warm and close relationship between the child and a mothering person in the early years of life. While the elusive characteristic of empathy relies on theoretical explication of its origins (Sullivan, 1947; Fromm-Reichmann, 1950; Guiora, 1965), the development of language and specifically articulation and fluency has been shown to reflect the quality of adult contact in the child's environment (May, 1965; McCarthy, 1954; FitzSimon, 1958). Thus the theory on which the present hypothesis is based is two-fold, accounting for both the developmental prerequisites of empathy and correct pronunciation and for the interaction of these skills in subsequent learning situations.

To test the hypothesis, measures of empathy and authenticity of pronunciation were necessary. Examination of the literature on both measures revealed few valid and reliable methods which could be used for this purpose. Previous research done on empathy was found to be either dependent on professional skills and training (Truax, 1963; Strupp, 1960), or was based on the unproven assumption that empathy is the ability to predict what another person will say, do, or think in any hypothetical situation, validated by how the other reports he would behave (Dymond, 1949; Mahoney, 1960; Speal, 1960; Baker & Block, 1957; Goldstein, 1961). The first type of measure was not suitable for use with naive Ss and the second type of measure is not consistent with the

theory that empathy is the immediate awareness of the emotional state of another (Guiora, 1965; Guiora, Bolin, Dutton, & Meer, 1965; Guiora, 1967). A technique that seemed to lend itself to the definition of empathy and allow for rigorous research application has been described by Haggard and Isaacs (1966) as Micromomentary Expressions (MME). The technique involves showing a silent motion picture sequence of a woman conversing and asking Ss to indicate observed changes in facial expression. It was discovered that when shown at slower than normal speeds facial expressions of intense feelings, unobservable at higher speeds, are detectable. The subsequent measure developed from this technique is based on the proposition that a S's ability to identify changes in facial expression at various speeds indicates his sensitivity to the affective states of another--his empathic capacity. While empathy is, of course, correct perception and understanding of the affective or emotional state, the methodological problems of naming emotions correctly would have added unnecessary complexities to the present study (Carney, 1929; Osgood, 1966). The measure proposed here is, by necessity, several steps removed from the direct measure of the empathic process.

A pilot project was previously designed to test the feasibility of the measure and the hypothesis under study. Fourteen teachers of French were employed as Ss. A rank order correlation of .60 was found to exist between the MME measure of empathy and ratings by native speakers of the Ss' accuracy of pronunciation (Guiora, Lane, & Bosworth, 1967). These results prompted a larger study emphasizing more rigorous measurements and a larger sample of Ss. This subsequent study will be described below.

Method

The Ss for the present study were all University of Michigan students. The experimental group consisting of 28 Ss was tested on language authenticity, MME, and several other measures for validation and control. The control group consisted of 31 Ss and participated in all but the language learning conditions. Approximately half of each group was male and half female.

The MME test of empathy consisted of three 30 sec. sequences of film of a woman during an interview. Only the head and shoulders of the woman were observable so that body cues were reduced to a minimum. The Ss saw the first two film segments repeated at speeds from the normal 24 frames per sec., to

16 frames per sec., 12 frames per sec. and finally to four frames per sec. These were considered practice trials. The third segment, the test condition, was shown twice at 24 frames per sec. to measure retest reliability and then at 12 and four frames per sec.

The Ss' instructions were to indicate each change in facial expression they were able to detect by pressing the button of a signal box on the table before them. Their response was recorded on the timed output sheet of a 20 channel Angus-Esterline chronograph. One channel marked each second while another indicated when the film sequence began and ended. This record allowed for tabulating not only the number of responses made, but scoring the accuracy of those responses according to an independently established pattern of facial changes. The criterion of accuracy was determined by asking four psychology graduate students to sort the 728 pictures printed from the test film into piles, beginning a new pile when there was a change in facial expression. The four judges agreed within three frames on 52 changes. The time of these changes was determined for the various speeds. Superimposing this pattern of correct changes on each S's record, with a minor adjustment for reaction time, provided a method to score correct responses.

In order to control the language learning situation, Ss were chosen who had no formal training in the language to be taught. They attended four one-hour sessions on consecutive days in which they learned basic dialogues and sentence patterns in Japanese from a native speaker.[3] On the fifth day they were tested as follows: first, the S participated in a dialogue with the teacher, using five specific sentences learned during the training period. Then the teacher spoke five Japanese sentences based on sentence patterns introduced during the training period, and the S repeated each one after the teacher. The first five sentences will be referred to as Spontaneous (Sp), and the last five as Repetitions (Rp).

All the tests were taped and two native Japanese linguists, not familiar with the study, were asked to judge pronunciation. The teacher also judged the pronunciation. Each judge made ratings of two types: first they rated each sentence on a five point scale for General Authenticity (ga); secondly they listened for Specific Criteria (sc) which they rated on a three-point scale (poor, fair, good).

The instructions for Authenticity (ga) rating included the sentence "Authenticity may be thought of as how much like a native-speaking Japanese does this person sound."

The particular points listened for and rated under the heading of Specific Criteria (sc) included the following:

Accentual pattern in various sentences.

Duration of various morae (or length-units) e.g. tottemo, ammari, gakkoo (each four morae), the final mora of desu [dɛs:].

Particular sounds and sound sequences, e.g., affricated z [dz] in gozai, affricated t [tz] in tukue, r in various words, velar nasal [y] in isogasi, hi = [ɕi] in hito, hu = [Φm] in hurosiki, etc.

Sentences were repeated until the judges had rated each of the criteria. While this approach at structuring the subjective rating procedure is not unique (MLA Proficiency Tests) its construction was specific to the material presented and it provided an important differentiation in language pronunciation.

Additional dependent measures included a test of visual acuity using the Snellen letter chart. The Pattern Perception Test consisting of a changing spectroscope record rather than a face was used in order to measure perceptual ability not dependent on empathy. In addition, Ss wrote stories in response to four cards of the Thematic Apperception Test. Also available were records of the Scholastic Achievement Test (SAT)-Verbal Ability scores for 23 of the 28 test Ss.

The scoring of the TAT stories was done by two independent judges trained in the use of the test. They scored the stories in two ways: first according to the instructions and examples given by Dymond (1948) in her initial research on empathy which indicates the S's sensitivity to the feelings of the characters in the stories. Second the scoring method described in the Menninger Foundation reports of research on Psychological Mindedness (Holt & Luborsky, 1958), focused on the complexity of motivation, levels of awareness, and interpersonal relationships in the stories. The first measure was included to give an additional index of empathy for use in validating the MME test. The second measure was included in order to ascertain whether sensitivity to MME's was simply an awareness of psychological factors, not necessarily empathy.

Results

MME scores dependent on the absolute number of responses made, such as total number of responses, number of accurate responses, and accurate minus inaccurate responses, correlated negatively with the four language authenticity scores and significantly so with Spontaneous (Specific Criteria). The proportion of accurate scores (that is the ratio of accurate responses to total responses) termed a measure of efficiency, reverses this relationship and shows a strong positive correlation with Spontaneous (Specific Criteria).

Insert Table 1 about here

Dividing the film segment into a series of one-sec. trials at each speed provided a means for scoring not only accurate responses but correct rejections, following the methods of signal detection research (Swets, 1964). In each sec. interval there either was a change or there was not and the S either identified it or he did not. The likelihood of a S saying a change occurred when the pattern of accurate changes does not coincide, provides a criterion or Beta score. This criterion score indicates when the S will decide to respond and is a component of style, not unrelated to personality attributes and sensitivity. The criterion score at 12 f/s correlates positively with the Spontaneous (Specific Criteria) score, $r = +.40$, $p < .05$.

The MME (total responses) was significantly related to Pattern Perception Test scores, $r = +.46$, $p < .05$. It was not significantly related to the TAT-Sensitivity to Feelings measure which was included in the test battery to validate the MME as a measure of empathy.

All language authenticity scores were highly related to the Scholastic Achievement Test-Verbal Ability scores, significant at the .01 level.

The TAT measures of Sensitivity to Feelings and Psychological Mindedness showed an interesting pattern of relationships which puts into perspective nuances of pronunciation not otherwise observable. The Spontaneous (Specific Criteria) score is significantly related to the TAT-Sensitivity to Feelings measure, $r = +.38$, $p < .05$. The TAT measure of Psychological Mindedness is significantly related to the measure of Repetitions (General Authenticity), $r = +.38$, $p < .05$. The two TAT measures are not significantly related to each other, nor are they related to another language score to a significant degree.

From this pattern emerged two clusters of independent variables which significantly predict different pronunciation skills. As Table 2 indicates there are four variables which significantly (Multiple R = +.72) relate to Spontaneous (Specific Criteria) and are relatively independent of each other. When combined in a multiple regression formula this cluster predicts more than half the variance of the Spontaneous (Specific Criteria) language score, $R^2 = .52$.

Insert Table 2 about here

A different combination of three independent variables, again relatively unrelated, accounts more than half the variance of the Repetition (General Authenticity) language score, $R^2 = .52$.

Insert Table 3 about here

Discussion

Most notable in the pattern of results is the consistently higher significance of Spontaneous (Specific Criteria) with the dependent and control variables. This is due to the skills on which the various language performance tasks depend. Spontaneous (Specific Criteria) seems to be the most exacting in that it calls for correctly hearing, coding, and retrieving the correct details of the dialogue learned in the preceding language sessions. The other language measures are immediate repetitions or are based on sounding generally authentic. While these other language tasks showed markedly skewed distributions of scores, the Spontaneous (Specific Criteria) approaches a normal distribution. Therefore, Spontaneous (Specific Criteria) seems to be the most sensitive in differentiating accuracy of pronunciation. Regarding general authenticity ratings, subsequent listening to the tapes and observing judges' scoring tendencies, suggests that judgment of general authenticity may not have been based purely on the genuine authenticity of Ss' Japanese pronunciation. In general it appeared that slower and more hesitant speakers were rated lower than the more fluent and confident-sounding speakers: often the hesitant speakers correctly pronounced the specific details, while the more fluent did not.

The fact that the TAT-Sensitivity to Feelings score, the only empathy measure comparable for validation, did not significantly relate to the MME measure suggests that the MME is not an adequate measure of sensitivity to affective cues. The scores based on absolute number of responses on the MME, which all correlate negatively with language, may be the result, for example, of anxiety about the task or the intensity of the feelings observed. This may reflect the channeling of anxiety into random and uncertain behavior. The MME scores based on absolute number of responses do not measure what is usually described as sensitivity to affective cues.

The MME scores relate positively and significantly only to the Pattern Perception Test scores; this suggests it may be merely a measure of perceptual ability, or, since the two tests are structurally alike and similarly ambiguous, a measure of ability to tolerate anxiety (a higher number of responses reflects lower tolerance). The MME total scores and Pattern Perception Test scores are positively related, $r = +.46$, $p < .05$. The MME total score is negatively related to language scores, while the Pattern Perception Test is not significantly related to the language scores. This imbalance suggests that the content of the MME test, the expression of human emotion, elicits a response style not explained by perceptual ability alone. The most likely alternative explanation is that anxiety is aroused by the emotions displayed as well as by the ambiguity of the task.

The Spontaneous (Specific Criteria) correlates negatively with the MME total score but positively with MME criterion score, both significantly. This suggests that individuals who are aware of the detailed nuances in a second language and incorporate them respond less frequently than other Ss on the MME (thus the negative correlation with the MME total responses) and tend to make fewer mistakes or false alarms when they do respond (positive relationship to MME criterion). This ability to attend to details and avoid responding prematurely seems to be a component of empathy.

Five distinctions in language pronunciation were highlighted by the relationships between the two TAT scores and language measures. The significant (.05 level) correlation between TAT-Sensitivity to Feelings and Spontaneous (Specific Criteria) supports the theory on which this study was based. An interpretation of this result suggests that those individuals who are more aware of feelings are more sensitive to the details and specific aspects of the second

language and reflect this in speaking. Such people tend to extend themselves toward others to understand their feelings, appreciate the details of their behavior, and respond appropriately.

The TAT measure of Psychological Mindedness was significantly related to the Repetition (General Authenticity) language score (.05 level). This indicates that those who see interpersonal behaviors in terms of motivations and expectations can sound as though they are speaking a second language authentically, although on closer analysis have not mastered the correct details. The psychologically minded have a need to understand underlying factors and causality in interpersonal situations reflecting a more egocentric need to be in control and confident. This is reflected in their ability to master the general impression of authenticity in speaking the second language, but these individuals lack the sensitivity to details which makes pronunciation correct and precise. This style of comprehending the total picture and imposing order from one's own framework rather than by extending oneself to perceive the feelings and behaviors of the other is similar to the intuitive mode of comprehending as described by Guiora (Guiora, Bolin, Dutton, & Meer, 1965). In making use of intuition an individual gains understanding by spontaneous reflections, often unconscious, on his own experience and feelings. The focus is opposite that of empathy--internal rather than external. The relationship between the intuitive measure and the ability to sound authentic when mimicking sentences, is distinct from the relationship of the empathic measure and the ability to correctly reproduce the subtle details of the second language. This reflects differential abilities operating in two seemingly disperate language skills. The TAT measures of Sensitivity to Feelings and Psychological Mindedness were secondary and gross attempts to control for personality characteristics possibly involved in the primary MME measure; however, they have produced other important results.

The significant relationship between the SAT-Verbal Abilities score and the language scores confirms a similar significant result found in the pilot study referred to above (Guiora, et al, 1967). General intelligence as a predictor of language learning has been disregarded in most linguistic studies (Gardner & Lambert, 1965; Carroll, 1965). However, analysis of both intelligence and language performance into specific components has suggested that a reliable relationship exists between verbal ability, as opposed to mathematical ability,

and the pronunciation of a second language. TAT-Sensitivity to Feelings and Psychological Mindedness are not related to this measure of verbal ability and thus add additional power for the prediction of authenticity of pronunciation.

The independent variables described above fall into clusters which correspond to definitions of empathy and intuition as described by Guiora (1967). Rather than relying on one variable to measure empathic capacity, four variables contribute to yield a dimension of empathy: MME total at 4 f/s, Criterion or Beta score at 12 f/s, TAT-Sensitivity to Feelings, and SAT-VA. As the discussion has focused on each of these in detail, it is apparent that they can be assembled into a viable index of empathic capacity. The relationship between the total MME scores and Spontaneous (Specific Criteria) represents anxiety aroused by the emotions Ss saw and impeded empathic involvement and understanding. Empathy depends on the "sensing being used by the cognitive functions to gain understanding of the other [Guiora, 1967]," and thus the measure of intelligence is another necessary but not sufficient factor for empathic understanding. The Criterion score and the TAT-Sensitivity to Feelings seems to be the first evidence to warrant analysis of empathy into components. The criterion score reflects the capacity to attend to another's experiences and communications without prematurely responding or reflecting on one's own experiences and feelings. The TAT-Sensitivity to Feelings suggests another unrelated factor pertaining to the quality of involvement and appreciation of emotional experiences. As Table 2 indicates, few of these variables are significantly related to each other although in combination they provide a consistent theoretical constellation of skills necessary for empathic understanding, accounting for more than half the variance of that pronunciation task in assessing the accuracy of precise details in speaking a second language.

The constellation of variables describing intuition can be similarly analyzed. In this instance, as seen in Table 3, anxiety elicited by emotional expression is a much less debilitating factor, but it sill significantly reduces intuitive ability. The intelligence factor plays a similar role here as a necessary ingredient for appropriate processing and mediation. (Guiora et al., 1965). The TAT measure of Psychological Mindedness is the key factor in defining this constellation and its relationship to Repetition (General Authenticity). As described above, the confident, fluent repetition of the second language phrases reflect not only detailed attention but a need to master the situation by producing

similar sounds from a more familiar verbal repertoire. Again this constellation of intuition-related components provides an important predictor of general authenticity in repeating sentences, accounting for more than half the variance.

The design of the present study assumes that an individual has equal ability in visual and aural perception. The S's empathy is measured by intricate visual stimuli while the teaching was entirely spoken with no visual stimuli. However, the work of Pimsleur, Sundland, and McIntyre (1963) and Moore (1968) suggests that preferences and abilities in these modalities are not equal. If this is so, more consistent results might have been obtained by not crossing the modalities in the present and employing research design to resolve an empathy measure developed for the auditory dimension. For example, a suitable evaluative procedure might be developed by filtering or alternatively blurring portions of speech typifying emotional states thus providing only the supra-segmental aspects such as pitch rhythm and volume. Ss would then be asked to report which of a list of emotions or emotional dimensions is being experienced in each recorded example. Clearly, resolution of these matters awaits further experimentation with both the auditory and visual modes.

Conclusions

The specific aim of constructing a direct measure of empathy was not achieved in the present study. However, by-products of the investigation have given validity to the theory under study and prompted further investigation. Careful differentiation of tasks and scoring criterion have provided abundant information regarding the ability to learn pronunciation in a foreign language.

Two constellations of variables representing the independent modes of comprehending were identified in this study and each was a significant predictor of skill in second language pronunciation. The empathy dimension consisted of a measure of tolerance to anxiety due to awareness of affective expression, intelligence necessary for cognitive understanding, a cautious style of responding only to another's expression of feeling, and an ability to be involved in emotional experiences. The first two are adjuncts of empathic functioning, while the last two are independent components of empathic capacity. The empathy factor is significantly related to the ability to learn and recall exact details of speech in a second language, accounting for more than half the variance of this skill.

A second mode of comprehending was defined by three unrelated variables and represents an intuitive dimension. Anxiety as a distractor and intelligence as a facilitator are necessary parts of this component. In addition its prime factor is the trait of focusing on the motives and complexities of interpersonal situations and gaining mastery through self-directed reflection. This intuition dimension is significantly related to the ability to sound fluent and authentic in repeating sentences in a second language, although it is not related to the precise pronounciation of details referred to above. Fluency of pronunciation and facility in mimicking, both consistent with intuitive skills, aid in the impression of general authenticity.

Footnotes

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[2]This research article has been submitted for publication in Language and Speech.

[3]Suzuko Osawa Nishihara, of the Far Eastern Language Department, University of Michigan, gave invaluable assistance in planning and teaching the language classes and in constructing the Specific Criteria for testing.

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Table 1

Summary of Correlations

		Language Scores					TAT	Inter-judge
	f/s	Sp(ga)	Rp(ga)	Sp(sc)	Rp(sc)	Pat. P.	Senst.	reliability
MME Total	24	-.08	-.10	-.50**	-.15	+.46*	-.13	
Responses	12	-.05	-.02	-.48**	-.12		-.07	
	4	-.19	-.26	-.60**	-.20		-.20	
MME Accur-	24	-.07	-.06	-.47*	-.12	+.35		
ate Resp.	12	-.08	-.09	-.50**	-.12			
	4	-.27	-.42*	-.55**	-.23			
MME Accur-	24	-.05	-.11	-.42*	-.08			
ate Minus	12	-.11	-.18	-.39*	-.04			
Inaccurate	4	-.10	-.23	-.25	-.08			
MME Propor-	24	+.10	+.01	+.30	+.15			
tion Acc.	12	+.07	-.04	+.35	+.08			
(Efficiency)	4	+.10	+.06	+.35	+.05			
MME Criter-	12	+.04	-.05	+.40*	+.12		+.06	
ion or Beta	4	+.11	+.15	+.30	-.17		-.10	
Pattern Perception		+.17	+.20	+.15	+.09			
≠ SAT-VA		+.47*	+.63**	+.48**	+.63**		-.08	
TAT-Sensi- tivity		+.14	+.09	+.38*	+.28			+.78**
TAT-Psych. Mindedness		+.30	+.38*	-.02	+.15		+.15	+.67**
Interjudge Reliability		+.89**	+.88**	+.77**	+.71**			

N = 28
* $p < .05$ level of significance, two-tailed
** $p < .01$ level of significance, two-tailed
≠ Based on N = 23

Table 2

Intercorrelations of Spontaneous (Specific Criteria)

	Spontaneous (sc)	MME Tot.	Criterion	TAT-S	SAT-VA
Spontaneous (sc)	1.00	-.60	+.40	+.38	+.37
MME Total 4 f/s		1.00	-.59	-.20	-.25
MME Criterion 12 f/s			1.00	+.06	+.001
TAT Sensitivity to Feelings				1.00	-.07
SAT-VA					1.00

Multiple R of 4 variables predicting Sp(sc) = +.72

R^2 = .52 (percent of variance accounted for)

Note: SAT-VA correlation reduced from Table 1 due to 5 missing scores, mean score substituted in those cases for computational purposes.

Table 3

Intercorrelations of Repetitions (General Authenticity)

	Repetition (ga)	MME Tot.	TAT-Psych.	SAT-VA
Repetition (ga)	1.00	-.26	+.38	+.59
MME Total 4 f/s		1.00	+.31	-.25
TAT-Psychological Mindedness			1.00	+.06
SAT-VA				1.00

Multiple R of 3 variables predicting Rp(ga) = +.72

R^2 = .52 (percent of variance accounted for)

Note: SAT-VA correlation reduced from Table 1 due to 5 missing scores, mean score substituted in those cases for computational purposes.